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SOME NOTES ON THE AMPHIBIANS OF HOUSTON, TEXAS

The following notes were taken during the author's stay of nearly a year at Camp Logan, from December 4, 1917, till the present date. The camp is located just outside the city of Houston on the north bank of Buffalo Bayou, here a sluggish stream from ten to thirty feet wide, flowing between high banks, wooded for the most part with pine, oak and sycamore. In some low places near the stream are tangles of bushes and grape vines. The natural enemies to the amphibian life are abundant in the shape of the Water Moccasin, the Western Ribbon Snake and the Water Snake.

Repeated search failed to reveal any Urodeles whatever, although I have been told of a "land eel" with one pair of legs, that lived in crawfish holes and was sometimes unearthed in digging trenches. The animal in question was undoubtedly *Siren lacertina*.

Of the Anura ten species were collected, representing four families. Most of these were found along the bank of the bayou where collecting was frequently difficult owing to lack of a net or any apparatus other than two hands. During the months of December and January there was no sign of Amphibian life, but with the signs of spring, early in February, the

frogs began to appear. Further observations are found under the list of species.

Gastrophryne carolinensis. June 15, 1918. A heavy thunder shower brought out the Narrow-mouthed Toads. Found them abundant and noisy in a large rain pool about ten o'clock at night. The call is harsh and grating, almost a bleat. It is repeated frequently but not as rapidly as that of the Hylas. The males sit in the water in the thick grass that fringes the pools, and are almost impossible to find with a light, although they are not at all shy. Collected six specimens by treading down the grass into the water and catching them as they swam. They swim slowly with their short legs and webless feet and do not dive when disturbed, as frogs and toads do. From this date until the middle of August I heard them frequently, but seldom in any abundance. After a rain one could be heard now and then in a pool or roadside ditch, before sunset as well as at night.

Bufo valliceps. April 15, 1918. Heard several in a pool and collected one. The call of the male resembles that of *B. americanus* very closely but is perhaps a little shriller and not so mellow. Male toads were still more abundant the following night and for a month after that a warm rain would bring them out, but I saw no females nor eggs during this time. Found the tadpoles of this species in shallow roadside pools in July and at Houston Heights I found them abundant in a concrete pool on factory grounds, August 12. The tadpoles are still very small, about 15 mm. long at metamorphosis and the newly changed toad measures only 8 mm. The tadpole is gray, coarsely spotted with black. I have had no chance to see how long they remain in the tadpole stage, but the development appears to be very rapid. August 25, 1918. Collected a female ready to spawn, at 4:00 A. M., this date. A thunder shower the day before had left a good many rain pools and this toad was

found in one which lasted only three days. There was only one female in the pool, but three males were clinging to her and there were four or five others near by. The mating call of the male is short and guttural, quite unlike the usual trill. When brought into the laboratory this female laid a quantity of eggs between the hours of 6:00 and 8:00 A. M. The eggs are in strings and closely resemble those of *B. americanus* in every way. From these notes it appears that this toad has no regular breeding season like the northern species but avails itself of water left by the occasional heavy rains of this climate. *Bufo valliceps* was the only toad I saw in Houston. It is quite abundant, hopping around at night much like *B. americanus*, which it resembles only superficially. I saw but one female of this species during the entire season.

Hyla versicolor. This species is fairly abundant near Houston and I have the following notes on it: February 13, 1918. Have heard several in the past few days calling from trees in camp, but have not seen any yet. April 15. Collected one specimen, a male that was calling from the branch of a pine tree. April 24. Found one calling in rain pool where *H. squirella* was breeding. I heard them frequently on warm evenings, answering each other from trees in the woods near camp. After the first of May they became silent and I heard and saw no more of them for the season. If they laid eggs in any of the pools near camp they made no such noise about it as they do in the North.

Hyla cinerea. February 13, 1918. Caught a young one in the grass close to the bayou. Found it actively hopping after dark, habits evidently nocturnal. In the course of the next two months I collected three others, two young and one adult 5 cm. in length. The latter was sitting on the top of a stub close to the bayou, fast asleep in the daytime. Throughout the month of May and into June I heard

this frog quite often, calling from trees at all times of day but most frequently late in the afternoon. The call has been compared to a cow-bell, which it resembles in tone, but the manner of delivery suggests a cuckoo. It usually consists of fifteen to twenty notes given in rather rapid succession, but too distinctly to be called a trill. The cadence becomes slower after the first, and the last few notes are often given with some hesitation. From the frequency of the calls this Hyla seems to be fairly abundant, but its secretive habits and protective coloration make it very hard to find. I could get no light on its breeding habits.

Hyla squirella. This species was more abundant than any of the other Hylas, but was the latest to appear in the spring. The first one was collected April 13. The following notes were taken later in the season: April 24, 1918. Found them breeding abundantly in a shallow pool after a warm rain. The call is a harsh, rasping trill, not so loud nor so musical as that of *H. versicolor.* From a distance the chorus resembles that of *H. crucifer,* but the call is much harsher when heard close at hand. The throat pouch of the male is large and expands to nearly the size of the body. Caught one mated pair and they laid eggs in a jar the next day. The eggs are laid singly, but tend to cling loosely to the bottom of the jar and to each other. In color they are light brown above and nearly white underneath. Diameter of egg not quite one mm., vitelline sac about .12 mm. in thickness, jelly outside that .25 mm. thick. The next night was cool and the frogs did not appear again until: May 4 A heavy, warm rain this evening brought out *Hyla squirella* in force. This seems to have been the regular breeding season and for some time after I heard very few of these frogs except for a little after every rain. July 31. Have heard a few frogs almost every night lately, calling from trees near sleeping quarters. They do not begin to call until ten or eleven o'clock

at night, and may continue intermittently till daylight. Usually a single one begins to call and is joined by half a dozen or so more until there is quite a chorus. September 20. Have heard very little of *Hyla squirella* lately, but rain fell all last night and to-night they were singing loudly again, although it turned cool after the rain.

Acris gryllus. February 8, 1918. Collected two specimens in Buffalo Bayou. They are fairly abundant all along the banks and are calling vigorously. The call is a soft trill resembling the tree cricket or the mole cricket. The frogs usually sit on the bank a few inches from the water. If danger approaches they plunge into the water and swim rapidly back to the bank unless too much alarmed, when they dive and hide in the mud. February 10. Collected seven specimens in daylight. They are not nocturnal in habit but seem to be active both day and night. This little frog was the first to appear in the spring and was abundant along the bayou all summer, but I never saw its eggs.

Rana sphenocephala. February 10, 1918. Collected one specimen in the bayou. May 30. Found young frogs newly changed in a pool near woods on the prairie. They were very abundant but agile and hard to catch. July 25. Saw one in the woods near the bayou. The species seems to be rather scarce. October 15. Found three clusters of hatching eggs, probably of this species, in a rain pool in woods road. The clusters had evidently been round and about four inches in diameter, though considerably softened and expanded by the hatching of the tadpoles. Saw an adult in the pool but was not able to catch it or be sure what kind it was.

Rana areolata. I saw but one specimen of this frog and collected that on June 18 at the Machine Gun Range, twelve miles out from camp. It was a

half-grown frog and was hiding under a log at the edge of a pool.

Rana catesbeiana. Collected a young Bull Frog in the bayou, February 13, and saw several later in the spring. July 25. Saw two very large Bull Frogs dive into Buffalo Bayou. Have seen very few.

Rana clamitans. February 13, 1918. Caught several young ones in the bayou. April 27. Saw a number on the banks of the bayou but could not catch any, they gave their usual sharp scream, and dived as I approached.

Since this paper was written the author has taken the following notes:

Siren lacertina. February 8, 1919. At Rice Institute I was shown a specimen recently captured in a roadside ditch and kept alive in an aquarium. They are said to be fairly abundant but are not often seen because of their subterranean habits.

Ambystoma (sp?). February 8, 1919. Saw a number of recently hatched larvæ at Rice Institute. Was told that salamanders and most frogs do not breed in rain pools but only in such places as ponds by artesian wells and irrigation systems where the water supply is constant.

PHILIP H. POPE,
Houston, Texas.

ON CARANX GUARA FROM BERMUDA

Definite records seem to be lacking for this species of Caranx in the West Indian region, except for one recorded by T. H. Bean from Bermuda (1906, Catalogue of Bermuda Fishes). Another specimen from there recently presented to the American Museum of Natural History by Mr. L. L. Mowbray in an extensive collection of Bermuda fishes, has therefore special interest.

Jordan and Evermann (1896) place several nominal species of Caranx under *guara* (Bonnaterre); as *platessa,* C. and V., East Indian, of which *georgianus,* C. and V., is probably a synonym, and *chilensis* Gay, West Coast of South America. Comparing figures of the Australian fish (*georgianus,* Ogilby, 1893, Edible Fishes of New South Wales, and McCulloch, 1915, Australia, Fisheries, *3,* pl. 20) and the Chilean fish (*chilensis,* Gay, 1848, Hist. Chile, Ict., pl. 6 with our specimen from Bermuda, the Bermuda fish is seen to differ markedly in thicker lips and in having the lower jaw notably included. This character will then readily separate Atlantic *guara,* from Pacific *platessa.*

J. T. Nichols,
New York, N. Y.

COLUBER SWALLOWING A STONE

It is a well-known fact that toads will snap up and swallow almost any small object that is rolled to them, shot, for example, and I recall one instance of a toad swallowing even a burning cigar butt, but it has only recently come to my attention that snakes, too, are not always very discerning in their selection of food.

One day during the summer of 1918 my mother was visiting Mrs. William G. Jones at Barachias, Ala., and while sitting on the veranda the two ladies were startled by a commotion among the fowls in the poultry yard. Investigation disclosed the cause to be a "chicken snake" (*Elaphe obsoleta*) that had just robbed a hen's nest. The snake was killed and found to contain a smooth, ovate stone that had served as a nest-egg in the pilfered nest.

Mrs. Jones has informed me that several years previous to this occurrence another "chicken snake" swallowed a china nest-egg from one of her hen's

nests. Neither of these nests contained anything besides the nest-eggs at the time the snakes visited them.

The interesting question arises as to why these snakes were unable to distinguish between an artificial nest-egg and a real egg; the difference being apparent to a human being upon a mere glance or touch. Of course, if a snake depends upon the olfactory sense alone the case is clear enough because even the china egg would retain the odor of a hen's body for a considerable time. Still, a snake certainly should be familiar enough with stones to be able to distinguish between them and articles possessing food value. But I will content myself with a statement of the facts and leave conclusions to be drawn by others more versed in snake psychology.

ERNEST G. HOLT,
Barachias, Ala.

TANTILLA CORONATA IN VIRGINIA

In a small collection of reptiles recently sent me for examination by Mr. W. T. Davis of Staten Island, I find a specimen of *Tantilla coronata* which was collected by him in Buckingham County, Virginia, near the James River about opposite Wingina, Nelson County, Virginia, on July 15, 1917. The specimen was found under a stone.

This is a new record for the state and a far north record for *Tantilla coronata* which has not previously been recorded north of Raleigh, N. C.

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Cambridge, Mass.

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